THE ZOOLOGIST

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SOME MISCELLANEOUS NOTES FROM GREAT YARMOUTH (1914–15.)

By Arthur H. Patterson.

The past distressful twelve months of universal warfare and strife have not been conducive to the peaceful hobbies of the individual; and the naturalist, among others, has been affected by the unrest. However, I enjoyed a few intervals of recreation, although my notes suffered; and the birds had been on the whole much scarcer. Not a solitary Spoonbill visited Breydon during 1915, nor, indeed, any bird of exceptional interest, to the present date.

The paucity of migrants, more particularly among waders, had been very marked both in the autumn and spring, although curiously enough the first week of September, 1915, provided us with as considerable a number of interesting, although familiar, species as I can well remember; my notes on these certain dates will be given later. My impression with regard to the last autumnal scarcity is that owing to the suppression of town lights and the extinction of those of the lightships, coupled with an almost continuous absence of "raw, rafty," misty nights, the little travellers passed over high above head in unbroken flight. Under normal conditions these illuminations would hold up and bewilder them on drizzly nights, when they remain flying around, calling incessantly to each other, until dawn appears and dispels their embarrassment, and they pass on. Many, wearied and hungry, naturally break their journey for a spell by a forage and a nap on Breydon "mudflats." It is then that "shoulder gunners" decimate the flocks, and the very few punt-guns now in occasional use belch forth destruction.

The abnormal rainfall has also had its effect upon forms other than human. The grasses around Breydon walls, grown rank and dense, owing to a shortage of labour and other causes, had not been cut down up to September; the jointed glasswort (*Salicornia herbacea*) was singularly stunted on the mudflats for want of sun, and the "cabbage" (*Ulva lactuca*) grew unusually abundant, the lack of heat keeping it green and sweet until a late date: the incoming of some stiffish tides will sweep it off in acres. The Greater Black-backed Gulls appear to have profited by it, for they might often be observed, in extended form, reaching for half a mile, like so many haymakers, throwing it over in their search for hidden small Eels and "Whitebait" left stranded by the ebb-tides, and the numbers of Shore Crabs that haunt it. A biggish tide occasionally washed large patches of it into the "drains" (channels), which sank in corner eddies, to be much frequented by Eels that root into it for crustaceans, &c. Now and then one's Eel-line would be smothered by floating bunches, and the Smelt-nets came to shore with loads of it. Up to the time of writing (September, 1915) I never saw on the Breydon walls and marshes fewer *Tipula* ("Daddy Longlegs"); and should imagine myriads of last year's eggs perished. I was astonished at the disappearance of the white goosefoot from the apex of the walls, where last year it grew in obstructive abundance, assuming more or less of a creeping habit. I think the Periwinkle (*Littorina littorea*) is becoming much scarcer on the mudflats, where it feeds on the *Zostera*; and Mussels are found only in a few shelly corners. Certain small "grups" opening here and there exhibited the white dead shells of the Clam (*Mya arenaria*) sticking out of the mud edgeways up. The *Hydrobia ulvæ*, which usually swarms on the stems of the *Zostera marina*, has been much obscured by the *Ulva*. I refer to these various outstanding features, inasmuch as they may have had certain effects on certain other species.

1914.

September 25th.—Waders fairly plentiful on Breydon, mostly Curlews, Whimbrel, Knots and Dunlins. On the following day

BRITISH MUSEUM

I observed a pair of handsome Snow-Buntings, male and female, tripping about on the sloping concrete wall: they were probably picking up the seeds of grasses and of the "wild cress." An early appearance.

An old gunner, who still retains a passing interest in Breydon, assured me that he saw an enormous flock of Curlews "make land" on the 12th, as he said "there fared to be thousands," and that they immediately broke into smaller groups and passed on. I have not had any confirmation of this arrival from any other witness.

September 28*th.*—A flock of weary Rooks beating up against a strong north-west wind; they seem to have had a rough time crossing the North Sea. I have heard reports of considerable numbers of birds going southwards: a big tide came up unexpectedly later on in the day, a testimony to a stiff blow from the Northern Atlantic.

Mr. J. H. Gurney wrote me on October 8th that great numbers of Lapwings, Starlings, Herring- and Black-backed Gulls, and also Wild Ducks and Finches passed North Repps and Cromer yesterday morning, all going due north (!) The Lapwings must have numbered 5000 birds. A few Kestrel Hawks accompanied them.

October.—I noticed during September, when staying at the houseboat at St. Olaves, that the Starlings feeding by day on the Haddiscoe and neighbouring marshes, pass over at eventide towards Fritton Lake, where I presume they spent the night in the reed-beds. Flock after flock repair just before sunset to a dilapidated drainage mill, about a mile up the New Cut (canal), to gossip awhile and preen their feathers, each successive flock passing onwards in rotation, thus making room for those that follow. This habit appeared to be very regular.

October 7*th.*—Redwings arriving: several seen in the St. George's Park.

October 16*th.*—Starlings are repairing each early morning to St. George's Park (our one small oasis), where they hunt in the brownish grass-bare patches, driving their mandibles with unerring instinct into the soil, almost invariably withdrawing them with a fat white Cockchafer grub. Their usual catch is six, with which they retire apparently satisfied. Park-keeper Woods, who is an interested observer, assures me that the birds thrust in their mandibles slightly open, a likely probability, seeing that it would require some effort to separate them when in the earth. On the 20th I had a pleasant time watching several birds busily grubbing. They quartered the ground like so many Spaniels, and with all the thoroughness of Knots working a small mudflat. I noticed the Sparrows were at hand ready to steal a grub if they could catch a Starling unawares.

The washing up of tar and petrol-bedaubed Rock-birds extended a considerable way along the coast. Redbreasts very plentiful in the Park. On the 16th I observed one busy little fellow catching minute insects, leaving this pursuit on one occasion by deftly seizing a worm, which it adroitly pulled out and devoured.

October 17*th*.—Gulls in flocks trooping inland from the sea at 3.30 p.m. to 4 p.m. Wind directly from the east. One small lot of Rooks, very high up, came in from sea.

Starlings to the number of fifty on the park this forenoon. I examined a number of holes bored by them; they were about the size that might have been produced by thrusting in a short length of pencil. Mr. Woods assured me that "their yellow heads" may be seen occasionally at the surface: he referred to the grubs. A Thrush that had secured a grub was deliberately set upon by a Sparrow, which snatched it out of its mandibles. Some of the holes were but two inches apart, but the majority did not approach each other by a foot.

October 20*th*.—I took my annual mid-October stroll along the North Denes close to the telegraph wires adjoining the Midland and G.N. Railway. I usually take it on the 17th, a date when I look for the maximum of bird-migration. Unfortunately some recruits were firing at the butts, so that I felt it imperative to give up the greater part of my ramble. I had found so far only a female Blackbird (killed against the wires the previous night)—cut almost in twain; and a Continental form of the Redbreast, the latter having killed itself without any observable injury.

Gulls moulting. Miles of primaries and other large feathers of Greater Black-backed and Herring-Gulls spread along the tide-mark, feathers touching each other almost without a break.

October 20*th.*—The park alive with Redbreasts. Woods tells me it is the heaviest incoming of the season. I observed fourteen birds on one small patch of grass "worming." They flitted around everywhere; and seemed to be very fortunate in finding small worms and probably the larvæ of the "Daddy Longlegs." Gulls going out to sea between 3 p.m. and 4 p.m., undoubtedly making for the fishing-grounds: the Herring-drifters had not yet given over fishing.

Up to the 20th I heard of several Woodcocks arriving, the first observed was on the 17th. That sweetest of British birds, the Goldfinch, appears to be greatly on the increase on the Suffolk border, thanks to the protection laws.

[As I write these lines the electric current has been cut off—thanks to passing Zeppelins!]

Gold-crested Wrens numerous on the outskirts of the town, more especially in the park.

October 22*nd.*—A very red sky this morning, and the south cone up. Gulls at 10 a.m. coming in from sea in crowds, flying very high.

October 23*rd.*—A great number of Corvines came over to-day, Rooks dribbling in in smaller numbers all the rest of the day. Saw a Wheatear which I thought might be the Desert Wheatear (*Saxicola deserta*). A large flock of Scoters flew past the harbour mouth, evidently they had taken up their old quarters off Corton beach, where *Mactra stultorum* appears to be fairly abundant, and the low forms of life that gather upon a *Sabella* besprinkled bottom.

October 24*th.*—Early morning beach stroll. Few immigrants; some Rooks and Skylarks came in, and some Jackdaws, the latter flying very high, but as usual noisily. More Jackdaws on November 1st.

Wasps.—Two on as late a date as October 25th visited me in the houseboat.

A very beautiful Red-throated Diver shot at the harbour mouth to-day (October 25th). The red throat was practically perfect, the head of that slate-colour which characterises the bird in summer, with just the smallest trace of white at the base of the bill. Mr. Gurney thought its occurrence so late with such a red throat remarkable.

October 29th.—A tired-out Woodcock found sitting asleep in a doorway in the heart of the town. Gulls getting woefully short of Herring refuse.

Mr. Woods showed me to-day (November 5th) his pet Redbreast. He had collected some Cockchafer larvæ in a tin, and whistled, when out from a maze of bushes came "Bob, the Englisher," as the park-keeper termed it, and picked off a grub that had been placed on the toe of his boot. "Bob" only takes two as a meal, and flits away to hiding, turning up when hungry again in the neighbourhood of its patron, whom it finds in any part of the park where he may be working. The bird allows no intruders in his own especial quarters: he is not so pugnacious though as the "foreigners." "Bob," on seizing a grub, and repairing with it to a twig, first pecks out and destroys the head before swallowing the remainder.

On this date I received a note from Mr. Julian Tuck stating that an Eider-Duck had been hooked on a line over Britannia Pier a few days since by an Ipswich sea-angler. He saw it alive at the museum on the previous day; it ate cut-up Herrings.

November 12th.—A windy day, blowing fresh from the N.-W. All day a concourse of Great Gulls flew around high above the town hall, wheeling in great circles—a habit I have noticed several times in recent years.

Mr. R. Beazor, fish merchant, informs me to-day (21st) that a fishing boat had brought in several crans of Herrings considerably scored on their sides; the fishermen had assured him that these wounds had been caused by Gannets, of which some considerable number had frequented the Herring-grounds.

November 27th.—Straggling flocks of Rooks coming over from seawards.

Writing to the 'Anglers' News' under date of November 19th, Mr. G. A. Whistler, of Aldeburgh-on-Sea, states that he saw a flock of Hooded Crows arrive in a tired condition: "One detached itself from the others, and, evidently exhausted, dropped in the sea. It seemed to rest and swim easily close inshore, and as I approached it rose and flew to the beach. There I got within a yard or two of it, but with an effort it struggled up once more and winged its way, in desultory fashion, to the windows of an hotel, where it hung fluttering on the ledge." I have myself observed a weary Corvine fall into the sea and rest a few moments, presently rising on the crest of a wave and again taking to wing.

There appeared to be more "Hoodies" on Breydon and the marshes than usual.

A Little Auk was picked up dead at Gorleston early in December; wind S.W. (!)

My entry for December 24 runs as follows:—

Breydon Birds. — Fine afternoon, peaceful and quiet. Rambled along the walls. Not a soul on Breydon, or near, wherryman nor gunner. Neap-tide sluggishly creeping up; town shut off by haze and smoke. Some scores of Gulls scattered about the flats, and quite a considerable number of Hooded Crows patrolling the flat-margins and grups. Many broken Mussel shells on ronds and walls. Hundreds of Dunlins, with some Ringed Plover and one noisy Redshank. A swarm of Lapwings on the marshes and quite fifty Snow-Buntings. Rat-runs very apparent on the inner grassy slope of the walls leading to water. Dead Gulls and a cat skeletonized on the rond by rats.

December 29th.—The lowlands were sloppy with excessive rain. These marshes, as far as the eye could reach, were swarming with Lapwings. I suspect that the worms being mostly ended, they were seeking larvæ of *Tipula* drawn to the surface by the water.

Bearded Tit.—I am glad to report that at a certain part of the Waveney the Bearded Tit would seem to have returned. One nest was found this year by a marshman "at the bottom of the reeds" (the usual place), with one egg therein. Evidently the old birds deserted it after this first had been laid, for when mowing the reeds in the autumn this same man re-found the nest with an egg still in it.

Four "Red" Crossbills were frequenting a "corner" at Belton, making use, my informant assured me, of a "regular sort of beat of trees." This same friend, who grows flowers for market, remarked on the frequency of Goldfinches, which came to the flowerbeds and picked out the seeds from the dead summer chrysanthemums.

A Kingfisher with white primaries had been recently shot in the neighbourhood.

The bullaces left on a certain tree (which my friend does not trouble to gather) are devoured at the beginning of winter by Mistle-Thrushes, *with the stones.* Blackbirds, which also like the shrivelled-up fruit, *beat out the stones* before swallowing.

1915.

January 1*st.*—The "bird of the moment" is the Lapwing, which is everywhere abundant on the thousands of acres of marshland, now fairly safe from prowling gunners, so much of the area being swamped.

Mr. Alma Nicholls, writing to the 'Anglers' News,' remarks on the abundance of Swans, "which are all over the place" (Broadlands). Two that he saw flew over a locomotive "so low that they went through the steam." He did not remark on the species, but possibly most were Bewicks with a sprinkling of tame birds, and probably some Whoopers.

January 2*nd.*—It is not usual for Redshanks to frequent this locality in winter; but at this moment a number are known to be distributed between here and Aldeburgh-on-Sea.

A beach gunner on January 9th obtained two Little Gulls at the harbour mouth, and two Little Auks. His dog swam out and seized a third Auk, bringing it ashore alive and uninjured.

Wrens.—Quite abundant on a walk from Brundall to Cantley on January 17th.

Wood-Pigeons plentiful in the market (January 16th). I saw one stall festooned with them. The stallkeeper assured me that near Ranworth they were exceptionally numerous; he had obtained sixty in one locality.

January 23*rd.*—Several Pochards in the market this morning. Stiff rime frost. A note on this date received from Mr. J. H. Gurney stated that "some large flocks of Pigeons passed over yesterday which seemed to come from the direction of Lowestoft."

A Little Auk picked up dead on the beach on the 26th.

A female Badger was killed in the neighbourhood of West Somerton (Broad district) early in February; and apparently another female was killed by a passing train near Ormesby station, as stated to me in a letter received on August 6th.

February 13th.—My Ranworth stallkeeper had kept up a goodly show of Wood-Pigeons up till this date, and to-day had a considerable quantity for sale. On the 16th I examined a lot of ragged-looking birds, badly coloured and with poorly defined neck-patches, but in excellent condition. They varied greatly in size and weight. I put three promiscuously on the scales, when they turned it respectively at 15 ounces, 16 ounces, and 19 ounces.

February 21st. — *Breydon.* — A beautiful spring-like day. Breydon like a sunny lake. Several Herons --some grand old males; birds evidently pairing. Quite a sprinkling of Hooded Crows. Some Wigeon. A considerable flock of Black-headed Gulls; a few adult Greater Black-backs. Some Reed-Buntings along the "walls," several Curlews, some Knots, and roughly two thousand Dunlins and Ringed Plovers on the flats.

Earlier in the week there were from two hundred to three hundred Wigeon on Breydon.

On February 28th I saw a beautiful Grey Wagtail (*Motacilla melanope*) on the rafts lying beside the edge of Breydon.

Jackdaws.—On a S.-W. wind a long flight of Jackdaws went over my house, on March 5th, before breakfast. Their noisy prating caused me to jump out of bed and rush to the window. I observed in all some one hundred and fifty birds pass over. A beach gunner had noticed this same flock from the seashore. Probably they were northward bound, but had dropped in for a rest on the marshes. Several flocks of Rooks came from east flying west. This movement covered from 8 a.m. to 12 noon; the last flock, coming inward against a fresh N.-W. by W. wind, appeared to be much wearied, and on reaching Breydon dropped low to the marshes but continued their flight, just skimming the surface.

The rookery in our market-place has been again visited by an increasing number of birds. Four nests had been built by March 17th, twenty nests by March 31st, and thirteen in the churchyard. Two new nests in a tall tree near the park.

March 5th.—Observed Hooded Crows "toying" after the fashion of Jackdaws dropping and tumbling around each other when in flight, like tumbler Pigeons, evidently pairing.

Dunlins.—It blew hard from the west to-day (March 6th). A flock of Dunlins washed off the flooded flats flew to the south rond to alight. The near birds alighted first, when the others dropped down in the rear of them, *flying backwards*, keeping their heads to wind. They sat there in so dense a body that a score might have been covered with a pocket-handkerchief.

March 12th.—Several Curlews on Breydon and some Grey Plovers.

March 14th.—Rooks coming over in thousands, passing due west, many extremely tired.

March 18th.—A yellow morning. Atmosphere colour of pea-soup. Wind from north; snowing all day. Saw a few adult Herring-Gulls and some very white Sanderlings. Breydon like a tumbling sea.

Wigeon.—There were quite five hundred Wigeon on Breydon on the 18th. On the 21st it was like a summer lake. I went round in the punt, seeing plenty of Dunlins, thirty Curlews in one flock, many Black-headed Gulls, and some Common Gulls, adult and young. Quite three hundred and fifty Wigeon busy on the *Zostera* near the watcher's houseboat. The fronds of this grass, discarded by the Ducks for the succulent stalk, began daily to float down-stream in biggish patches.

Quite one hundred Ringed-Plovers on the flats on March 24th.

March 26th.—A Woodcock of the smaller dark variety had been picked up on the sea-front, having struck a telegraph wire, cutting its crop completely open.

Crows and Mussels.—At low-water on Breydon the Hooded Crows repair to the emptied grups and wrench off Mussels, which they find attached to sunken flints and other hard substances. With these they repair to the "walls." Years ago, when nearly all the water-ward sides of them were faced by jagged flintstones, these were used as anvils on which to drop and break the shells; in many cases the mollusc fell into gaps between and was lost. To-day the birds make for the concreted slopes, easily retrieving the shellfish at the base. Small Mussels are pecked open on the hard clayey apex; the larger ones only are dropped. On March 27th the "walls" were besprinkled with broken valves. On April 19th "Jim Crow" unwittingly showed me his methods. I was nearing a certain corner, walking at the grassy base of the wall, when a Hooded Crow shot up six feet above the wall, with his tail towards me, and down fell a large Mussel on to the concrete slope on the other side. He had no idea of my presence as I skulked in the grass and crawled nearer. Four times he dropped the Mussel unsuccessfully, but managed it on the fifth attempt from an increased height, when he descended in triumph to enjoy his luscious tit-bit. I rushed up the wall and surprised him, but he had already torn out the bulk of the meat. Up he flew in a hurry with four of his brethren, who had apparently waited for him to finish his dinner. A little farther on I observed a mixed flock of Rooks and "Hoodies" grubbing at Mole-heaps, evidently in search of worms and insects.

March 31*st*.—Two hundred and fifty Wigeon on Breydon today. A flock of thirty Knots, all as grey as in winter, feeding in almost as compact a flock as sheep. They were so tame and unsuspicious of me that they kept just ahead of my punt's bow as I rowed.

I am informed by a friend that quite thirty Bearded Tits visited a certain part of North Suffolk a week ago. Four Jays were busy in a wood as I stood chatting with him on March 31st. Eight Crossbills visited his garden yesterday. I saw a freshly killed viper hanging on a hawthorn branch. Several Snipe in the vicinity were busy, and drumming. Observed a Goldfinch busily tugging at a fir-cone on a fir-tree; and a White Wagtail (*Motacilla alba*) on the edge of a garden. The Yellow Wagtail (*M. raii*) has been singularly scarce this year.

Two unfortunate immature Black-headed Gulls caused a little talk in April among Breydon frequenters. At first sight they suggested Grey Plovers, but a nearer view showed them to be Gulls that had evidently dropped down upon floating tar or petrol; they were grey above and black beneath. All the other Gulls objected to their company and they remained together, companions in distress. They could make but a very poor flight, and undoubtedly succumbed in the end. A fisherman tells me that at sea he had caught "Kittys" (Kittiwakes) by means of tarry twine whirled around among them, and on baits of livers and fish entrails. He had dropped the birds down the flue, sootying them all over, and then put them adrift much to the disgust of the other birds, who treated them exceedingly roughly.

April 8th.—Two beautiful Lesser Black-backed Gulls on Breydon, in company with a couple of adult Greater Black-backed Gulls. The Lesser is becoming, I think, rarer here yearly. Same date, saw Redshanks plentifully distributed along the Waveney river.

April 10th.—Numbers of Linnets (*Linota cannabina*) passing over Breydon, probably on migration.

A Cormorant on Breydon on April 10th.

When busy in my boat-shed on April 13th I heard a rare commotion among the Gulls. On hastening out I was just in time to see a Peregrine Falcon passing over to the southward at a great pace, sailing and circling. It was in all probability this bird that a marshman observed harassing Starlings—some two thousand in a big crowd—singling out a victim it dashed at and secured it. The same marshman, who was a keen shot and has since joined the army, had on one occasion seen a Peregrine "go for" a Grey Lag Goose. He told me the Goose doubled and tried its hardest to escape, but would have been struck had he not himself shot it as it dashed past him. He said he recollected a Peregrine attacking a Swan. It is a belief hereabouts that this Falcon will not attack large Gulls.

An immature Greater Black-backed Gull was pursued by several others, on April 18th, across a mudflat; it was carrying, apparently, a parcel of fish entrails. Round and round they chased it, shrieking noisily. A Hooded Crow joined in the chase, and actually grabbed the booty as the original finder dropped it on the mud, but as he was joyfully tearing off with it the first Gull dashed impetuously at him, making him drop it in the water, where it sank beyond reach. On the 29th I saw another quarrel between Gulls, this time upon the surface of the water. Presently a bird rose with a large dead eel, which he actually managed to swallow as he went upward, but immediately disgorged it, being too lengthy to keep down, and all successive attempts were futile. I made a rush into the squabbling company with the punt, when they left me in possession of their quarry. On lifting it into the boat on an oar I found it to be about twenty-eight inches long, as thick round as a florin. The eel had been dead some time, and floated head and tail downwards like a horseshoe in shape. Gulls are great scavengers, alike keen on carrion as on fresh meat. Wigg, a gunner, assured me he had, during some sharp weather earlier than this date, noticed a Grey- and a Black-back pulling a freshly-killed Mallard to pieces; they had so badly mauled it that he left it with them. On returning he found the remains perfectly cleaned.

May 1*st.*—Some Whimbrel here; more next day, and a grand old Oystercatcher, several Swallows, and six Wigeon.

Two fine adult Sheld Ducks feeding on the flats on May 7th. On this date I also observed a flock of five hundred Starlings wheeling about; they broke up into two parties, when a Whimbrel joined each, and for some minutes performed the evolutions in perfect unison without a single error.

Early morning at Brundall, on the Yare, on May 8th, provided one with a Babel of bird-song. At three the Thrushes and other songsters, hidden from view by the opening foliage, were whistling and chortling in such numbers that the accumulated chorus was novel, surprising, and indescribable. The Cuckoo called at 3.20. I saw several Swifts during the day and many Sand-Martins in the course of a long day's tramp—towing the house-boat down to the Waveney—along by the marshy river banks.

Redshanks are scarce along the Yare, and by no means so plentiful on the Bure as in my youthful days; the Waveney, with its more solitary and wetter marshes and ronds, being more greatly favoured by them. They are exceedingly fond of feeding on ronds subjected to frequent saline tides.

May 16*th.*—Two Black-tailed Godwits observed on Breydon. On the 20th I saw a Crow with white primaries feeding on the mudflats. On the 21st a great fight took place among the Rooks, one colony making a raid on another, pulling each others' nests to pieces.

June 1*st.*—About thirty Ringed Plovers and Dunlins, evidently as yet unmated, on Breydon. Some fifty Gulls, all "greys," next day; and a few Godwits and Greenshanks still with us on the 5th. An immature Cormorant for some days frequented Breydon, choosing a particular stake for a roosting-place. He was observed to capture a goodly-sized Eel. Half a dozen Grey Plovers, only two with black vests, on the 11th.

Two large bunches of Curlews arrived on August 7th; I also saw a number of Whimbrel, some Greenshanks, and several Lesser Terns and young. About three hundred and fifty Black-headed Gulls.

Observed an adult Kittiwake Gull perched on a stranded tree-stump on Breydon on August 20th, and several times subsequently, mostly on top a stake. A rather unusual species here at any time, except in very severe easterly gales.

The first Wasp of this season looked in at the houseboat on August 25th, although for some time at a neighbouring village they appeared to swarm. In a grocer's sugar-bin I saw a colony of them! Mosquitos were troublesome at night on the Waveney, when I was Eel-fishing near the reeds: I found that anointing my face and neck with Worcester sauce was a most effective protection. They do not bite, but annoy me when their attentions are diverted my way. Quite a thousand swallows, including some Sand-Martins, on the telegraph wires near Haddiscoe Canal.

A Long-horned Owl passed over me when Eel fishing on the night of August 26th; a great Noctule Bat flitted into its line of flight, when I presume the scent of the bird, left behind it, very much perturbed the flying mammal.

August 28th.—Very high tide on Breydon; I had pulled out my smaller Breydon Noah's Ark, and was surrounded by Swallows and Sand-Martins busily snapping up small insects, and probably small Beetles which had climbed to the heads and tufts of the saline plants, just above the surface of the water. A great concourse of Gulls, in extended order, patrolled the flats at low water, turning over the *Zostera* and *Ulva* most systematically in search of Crabs, &c.

Hundreds of Black-headed Gulls on Breydon on August 31st. Several Curlews and Godwits came in from due east, August 31st, making a great clamour.

Flock of Wigeon, September 1st. A wild night on Breydon on May 2nd, when I sailed my little punt, with rowing chocks often under water, homewards. The sky was brilliantly fiery, and the clouds of marvellous shapes and colours at sunset. Passed many waders on one flat, and many Gulls. The roughest passage I have ever made in this cockleshell.

Hundreds of Dunlins and Ringed Plovers, in scattered flocks all over Breydon. Many Godwits and Grey Plovers; the plaintive notes of the latter were so incessant and monotonous that they almost got on one's nerves. Six Little Stints on a salting.

A White House-Martin seen at Horning in September, having been bred there. A hand-reared Mallard had been seen perched on a motor-shed; and a Snipe on top a telegraph pole in the same neighbourhood.

September 5th.—A Babel of bird sounds—a jumble of low whistling notes from the flocks of waders collected on the higher parts of the flats at high water to-night was remarkable. I passed one area of some 50 square yards crowded with Godwits, Grey Plovers, Curlews, Knots, and other waders, and so near that a hat might have been thrown into their midst. And the Gulls on a distant flat were cackling loudly and incessantly.

More migrants.—Sailing down Duffells Drain, from my small houseboat, on the morning of September 6th, I passed another congregation of waders, among them many Knots (one gunner secured thirty), Grey Plovers, Curlews, and, I believe, some Curlew-Sandpipers among other small birds; probably several rarer birds were here to-day. Dunlins and Ringed Plovers were flying everywhere in flocks of various sizes. I have not seen such an immigration here in early September for several years.

THE RELATION OF THE OYSTERCATCHER TO ITS NATURAL ENVIRONMENT.

By J. M. Dewar, M.D.

(Continued from p. 346.)

V.—Discussion of the Summer Environment.

The conditions common to most of the stations of the summer habitats are the following: a body of fresh water, a breeding area of water-worn shingle, composed of light grey stones of medium or small size, the area being adjacent to water, raised above the level of summer floods, and fairly well-preserved from human intrusion; a local feeding-ground to which there is easy access for the young on foot, rich in tipulid and coleopterous larvæ, and with at least a moderate supply of large earthworms; a more distant feeding-ground of cultivated land, accessible to the adults, and richly stocked with large earthworms.

The first condition is an essential requirement and is used in many ways, of which the act of drinking is only one. Both the adults and the young bathe in the water, and stand in it by the hour. A large still body of water, or a narrow deep or quickly flowing stream, safeguards one border of the breeding area from intrusion, and favours the detection of approaching danger. The young in danger frequently crouch in shallow water among stones, and in the last resort swim boldly out on the open lake or across narrow and not too rapid streams. In the river settlements especially, a portion of the food supply for the young is got from the shallow waterside.

Shingle does not form a necessary condition of the breeding area. It is absent from North Holland where the birds nest commonly on areas of grey mud, as do most of the birds in the Moulinearn Settlement, while at Ballinluig nesting on turf under trees is common. On shingle, however, the eggs and young are incomparably harder to find than on any other substratum used in this locality. At Moulinearn and Ballinluig the young are led to the shingle soon after they leave the nest, and thenceforth the shingle forms both their refuge and resting place. The eggs laid on mud or turf are not better protected by their surroundings than they would be on shingle, but in disturbed areas they have a better chance of escaping human observation which, by tradition or personal experience, tends to be concentrated on the shingle. The young get the benefit of the shingle even in disturbed areas, because, unlike the eggs, they can occupy positions likely to evade detection on the approach of danger. And in all the stations examined, with the exception of those in the hill-stream habitat and in the aberrant area of the Garry, the shingle forms the headquarters of the young. In wet weather, however, the shingle looks almost black. The eggs and young then show up more distinctly. But the deficiency has less importance than it seems to have. The adults, which stand out conspicuously from the dry light grey shingle, assimilate more or less completely to the shade of the wet stones, and during wet weather the parents are covering either the eggs or the young. After a short exposure to rain the wetting of the outer down changes its hue from light greyish to drab. The young then approach in shade that of the wet stones.

Evidently the essential requirement of a breeding territory is an open area of sufficient extent, and approximating in colour appearance to that of the eggs and young. These conditions are best fulfilled by shingle devoid of vegetation. The bareness of the normal breeding territory has, however, a wider significance. After the young are hatched, and for several weeks to come, they are prevented by the parents from going among wet grass when the temperature is low. The combination of moisture and low temperature occurs regularly in the early morning, and occasionally through the daytime as well. The chicks are compelled to remain on the shingle where, though the stones may be wet, the chicks at least remain dry. The proceeding must have attached to it a pronounced biological advantage, for I have repeatedly seen hungry chicks which have already learnt the association of the position of the feeding-ground with the act of being fed, trying to entice the adults to follow or lead them on to the wet grass to be fed. A second result of the bareness of the nesting area is the poverty it shows of animal food. The normal hatching of the chicks coincides with the presence of large numbers of Stonefly nymphs under the stones at the water's edge. These nymphs are fed extensively to the young soon after they leave the nest. Beyond this the breeding area contributes little or nothing to the feeding of the young, and the need is insistent for an additional area capable of supplying the food required. In all the occupied areas the shingle or mud stands high enough to be above the probable level of spring and summer floods. It matters little for the young, but it may be serious enough for the eggs. Evidence is not awanting to show that the nesting activities in relation to water level are adjusted to the normal breeding time only. When a second laying becomes necessary, adjustment is not so accurate.

On the shingle nesting and the rearing of young are confined to those parts where the stones are not larger than the eggs. The stones may, however, be much smaller—little more indeed than fine gravel—without preventing nests being formed and eggs laid. But wherever the stones are considerably larger than the eggs nesting does not occur, unless there are islets of smaller stones amongst the larger. These islets are used occasionally, even though little larger in area than the nest itself. But the protection afforded to the nest by the substratum is inadequate, for the nest, together with the clutch, break the monotony of the general surface, and are fairly easily found. Though the young, in the act of crouching, may respond to a larger boulder by moving up against it, they invariably rest on shingle not larger and often smaller than themselves, and the bulk of their activities, within the breeding territory, is confined to areas of shingle whose components are of medium or small size.

On the River Lyon a pair of Oystercatchers breed successfully on a small shingle island near Chesthill. The island is wholly devoid of vegetation, and completely isolated by turbulent rapids. The history of the settlement was not worked out. But the difficulty of evoking the crouching reponse of the young from the mainland, and the comparative indifference of the adults to one's presence, render it unlikely that the young are not born and bred on the island. Thus a local feeding-ground, accessible to the young, is not a necessary condition of the summer environment. In all the other stations, with the exception of Clunie, where eggs have not been known to hatch, a local feeding-ground is present, and may, therefore, be regarded as having great ecological value.

The most valuable conditions of the local feeding-ground are the presence of a large stock of tipulid and beetle larvæ, and comparative freedom from human intrusion. The conditions are best fulfilled by fenced-in old pastures. Ground of this nature is attached to most of the breeding areas. On the Orchy, however, it is absent, and the grassy river-bank takes its place. The great value of an area of old turf is made evident by the history of the Dunavourd territory, where the breeding territory ceased to be occupied whenever the old pasture was ploughed. Occasionally arable land forms the local feeding-ground. In the middle Logerait settlement, and on a shingle island in the River Lyon near Chesthill, wooded islands are the only available local feeding-grounds. The upper island at Logerait and the island at Chesthill are apparently of natural origin, and provide a different food supply for the young from that occurring in the normal feeding-ground. The fauna of the ground strata of the naturally wooded islands appears to be that of the flood-plain forest association.

The third area of a favourable station—the general or distant feeding-ground—has, as its chief functions, the feeding of the adults and the supply of large earthworms for the young. For the latter purpose cultivated land is best adapted. Cultivated land adjoins all the breeding areas of the Tummel, Garry and Fender. Under certain conditions (*e.g.* drought) the young receive very little food from farm land. Arable soil is practically absent from Upper Glenlyon, and from Glenorchy above the Bridge of Orchy. It is, therefore, not essential. But the distribution of the birds shows that, wherever the unproductive hillside takes the place of cultivated land, a much larger area is required to support the same number of birds. The occurrence of cultivated land in the environment is, of course, a secondary condition. It is possible the distribution of the boulder clay, and especially its presence on south-western exposures, favoured the settlement of the earthworm, and thus effected a primitive control over the distribution of the Oystercatcher population, and cultivation, by still further favouring the earthworm, only confirmed the process.

Summing up the essential conditions of the breeding habitat, we have: a sheet or stream of water; a nesting area to which the eggs, and more especially the young, have a protective resemblance; a general feeding-ground accessible for the adults and providing a large supply of earthworms; comparative immunity from enemies in the breeding territory. A local feeding-ground is of so general occurrence, that it may be regarded as approaching the essential. The requirements here are accessibility for the young, a large stock of tipulid and coleopterous larvæ, and a certain freedom from disturbance.

In summer enemies have a greater influence than in winter. Most injury is wrought before the end of incubation. So much is this the case that, if only the young can be hatched, they have a very good chance of reaching the stage of flight. Most destruction is caused by man. He takes the eggs, while youths, as I have observed, stone the young. The adult birds do not suffer in themselves through the agency of man. On the contrary, they benefit, as I have shown. In nesting areas, to which sheep and cattle have access, the eggs may be trodden upon. On one occasion I witnessed the actual event: on another I found a nest containing crushed and flattened eggs, to account for whose state cattle were the most likely explanation. The young do not appear to suffer from these animals. But they may come to grief from the chance step of a human being, as then the adult birds do not interrupt the special means which serve as stimuli for the crouching reaction. Without disturbing the crouching response in the least degree, I have abraded the skin of a chick which I failed to see in time to avoid the accident. The Buzzard causes a good deal of commotion, but has not been seen to attack the young. The Sparrowhawk, Kestrel, and Merlin produce little effect. The Lesser Black-backed Gull, as it sails over the breeding area, has a profound influence upon the situation. The young Oyster-catchers crouch at once in response to the warning call of the adults, which, thereafter, stand absolutely still in dumb watchfulness. No attack has been observed. The Black-headed Gull, which often tries to snatch away the young of the Ringed Plover and Lapwing, has been observed to threaten only the very young Oystercatcher. The effect of ground vermin is not known. But no eggs or young under observation have disappeared without the disappearance being accounted for, at least as well, in other ways.

In the breeding season, so far as one is able to judge, the succession of day and night is a factor, but not an important one, in regulating the activities of the birds. The diurnal cycle is rather complex, but it may be summed up as a periodic alternation of rest and activity, the latter being of two kinds—nuptial or social, and food activities. It should, however, be understood that these periods are not simply periods of rest and activity. All that can be said is that in one period the resting phase predominates, in the next the active phase, and so on alternately. The period of greatest darkness lasts from about 11 p.m. to 1 a.m. Contrary to what one might expect, it is not a period of rest but is rather a period of the wildest activity, and that apparently not of food-getting, but nuptial. Activity continues till 4 a.m., but it passes gradually into food-getting for both adults and young. After 4 a.m. the sun begins to diffuse an appreciable warmth. Activities lessen, and a quiescent period appears which lasts till 10 a.m. During the earlier part of this period most of the "apparent" sleep is obtained. Ten a.m. till 2 p.m. is a fairly active period, devoted mostly to food-getting. From 2 p.m. till about 6 p.m. the birds are mostly resting except for occasional and short-lived storms of either kind of activity. After 6 p.m. the birds are really active, at first in getting food for themselves and the young, and then, by degrees, the feeding activity is interrupted by the nuptial activities which later work up into the fully developed midnight orgy. Such is in general outline the diurnal rhythm of the Oystercatcher at an inland breeding station. Exceptional features, of course, occur at any hour and place, and very frequently the normal rhythm is entirely upset. On very dark nights all activities, so far as one can then determine, are suspended for the hour or so of greatest darkness. On very clear nights many birds (? barren) leave the breeding areas and make extended journeys into the hills, where they are not seen in the daytime.

It will be observed that the two periods of rest coincide, the one with the period in which the warmth of the sun is first beginning to be felt after the cold of the early morning, and the other with the period in which the heat of the sun is most fully developed, and that the two chief periods of food-activity, that is morning and evening, coincide with the periods of greatest activity in the earthworm. It is probable that the periods of rest have become rhythmic habits, at least during the breeding season, for they appear even when the weather is cold and wet.

In the breeding quarters the variations of temperature, occurring in May and June, have no apparent effect on food-supply; any disturbance that takes place being due more probably to the other climatic conditions commonly associated with temperature extremes. In hot weather the adults may become dull and listless, but the condition does not last long owing to the frequent recurrence of food—and other activities. The chill of night has evidently no more than a bracing effect on the birds. One instance of "physiological misery" has come under notice. An adult, after a spell of food-getting for the young in the early morning, bathed about 4 a.m., and then went to "apparent" sleep. The rigor which followed lasted a considerable time. The young bear wide variations of temperature with equanimity. During the first two days of life they are very sensitive to cold, and are covered almost continuously. Thereafter, they have to rub along on all sorts of days without additional warmth, except during the coldest part of the night. They seem indifferent to hot sunshine, and I have not seen them shelter under the wings of the parent when the sun is particularly hot, as young Lapwings do in similar conditions.

In summer no injurious effect of excessive moisture on adults or young was discovered. Both are extremely hardy, and they then enjoy an abundance of food, especially of earthworms. Drought reduces the supply of these both for the adults and the young. Worms may even be unobtainable. If worms cannot be got, efforts are rarely made to bring other food from the distant feeding grounds, and prodigious exertions are evoked to supply the wants from the feeding area attached to the nesting quarters. The sun-baked ground is hammered and pickaxed with the powerful bills, the parents working feverishly, and for long periods at a time, to supply the necessary quantity of food for the young. Occasionally, young have been seen to manifest signs of more than passing hunger owing to the drought-induced dearth of earthworms and the difficulty of getting other supplies. But in no observed instance have the young appeared to suffer permanently in consequence of the shortage.

VI.—The Choice of a Nesting-Site.

In the choice of a nesting-site which is placed near a body of water, an important factor must be the relation existing between the position of the nest and the level of the water at the time of building, and any possible rise in the level of the water during the subsequent period of laying and incubation. In the river-valley habitat the nests are formed on the highest part of the banks of shingle, and in the case of the semilunar beds, which form on the convexities of the alluvial cones, the nests are laid on the longitudinal ridge which has formed in the shingle, a short distance from the grass bank. In the lake-shore habitat, as represented by Loch Tummel, the problem does not appear to be so simple. The beach of the alluvial cones has, for the most part, an even gradient from the water-edge up to the grass. The nests, as a rule, are formed on, or about, the highest winter water-mark. But in places the mark is not evident, and apparently is not detected by the birds. In other parts the high-level mark reaches up over the grass. Where this happens, the nests are formed on the shingle within a half to one metre of the bank. It is probable that, in the choice of a nesting-site in this locality, the adjustment of the bird to the environment is more perfect at the normal period of laying than it is at a later time. This may be put in another way by saying that the normal period of laying occurs at a time when the level of the loch is already low and still falling. At a later period the loch is either at bottom level or has actually begun to rise. At the former period the choice of a nesting-site is stereotyped, appropriate to the local conditions, and successful. At the later period the birds respond with the stereotyped reaction to conditions which are essentially, though not obviously, different from the normal, and which day by day may depart still further from the normal.

(To be continued.)

A CATALOGUE OF THE LAND AND FRESHWATER MOLLUSCA OF SUSSEX.

By E. W. Swanton.
(Member of the Conchological Society; Curator of the Educational Museum, Haslemere.)

(Concluded from p. 353.)

(Plate IV.)

Succinea putris, Linné.—Generally distributed.

Var. *solidula*, Jeffreys.—One specimen near Lewes (C. H. Morris).

S. elegans, Risso.—Widely distributed.

Var. *longiscata*, Morelet.—Pevensey Castle Moat (Rev. W. A. Shaw).

Var. *pfeifferi*, Rossmässler.—Frequent with *S. putris* at Lewes (W. C. Unwin); Hastings district (Tumanovicz); near Pulborough (E. W. S.).

Var. *virescens*, Morelet.—Near Bosham (Rev. W. A. Shaw).

Carychium minimum, Müller.—Generally distributed in damp situations.

Ancylus fluviatilis, Müller.—Generally distributed in clear running streams.

Var. *albida*, Jeffreys.—In a tributary of the Rother near Midhurst (W. Jeffery).

Acroloxus lacustris, Linné.—Locally abundant in ponds and sluggish streams; there are many records from both divisions of the county.

Var. *albida*, Jeffreys.—In a pit at Bosham (W. Jeffery).

Limnæa auricularia, Linné.—Very local. Ponds and sluggish waters. Lewes, in the "Cut," rare (W. C. Unwin); the Rise, Lewes (C. H. Morris); ditches, Pett Levels (R. Tate); Chichester district (W. Jeffery); Littlehampton (D. Taylor); Bognor (H. L. F. Guermonprez).

Var. *acuta*, Jeffreys.—Southover, Lewes (Jenner); ditch near the railway, Eastbourne (Hastings Phil. Soc.).

Var. *ampla*, Hartmann.—In ponds in a garden at Ratham, Chichester (W. Jeffery).

L. pereger, Müller. — Generally distributed; of frequent occurrence in the mist ponds on the Downs.

Var. *candida*, Porro. — Wannock Glen and the Pevensey Marshes (G. A. Stubbs).

Var. *labiosa*, Jeffreys.—Pond between Horsted Keynes Church and the station (W. Whitwell).

Var. *marginata*, Michelet.—"Taken by Mr. C. H. Morris in an isolated pond on the Downs near Lewes. This curious form perhaps arises from excess of calcareous matter in the water, as at times the pond is thick with chalky mud brought down by the rains" (J. H. A. Jenner).

Var. *ovata*, Draparnaud.—Chichester district (W. Jeffery); Harting (Weaver); Southover Marshes, Lewes, and at Battle (Jenner); fish-ponds at Fairlight (R. Tate).

Var. *acuminata*, Jeffreys. — Ratham and Chichester (W. Jeffery).

Var. *inflata*, Kobelt.—Affluent of Ouse, between Burnt Oak and Hayward's Heath (W. Whitwell).

Var. *oblonga*, Jeffreys.—Lewes (Gwyn Jeffreys).

Var. *lacustris*, Leach.—St. Leonards (R. Tate).

Monst. *scalariforme*.—A fine specimen at Thorney (Rev. W. A. Shaw).

L. palustris, Müller.—In sluggish waters; widely distributed.

Var. *albida*, Nelson.—Near Lewes (C. H. Morris).

Var. *elongata*, Moquin-Tandon. — Winterbourne Stream, Lewes (Jenner).

Monst. *decollatum*, Jeffreys. — Pond at Battle (Jenner); Pevensey (Rev. W. A. Shaw); Surrey and Sussex Canal, near Alfold (E. W. S.).

L. truncatula, Müller.—Very common. This species is the intermediate host of *Fasciola hepatica*, an endodermic parasite which causes "liver-fluke" disease in sheep.

Var. *minor*, Moquin-Tandon.—Near Lewes (C. H. Morris).

L. stagnalis, Linné.—Widely distributed. Mr. Clement Reid records that it was once found in a dew pond on the Downs.

Var. *labiata*, Jeffreys.—Ratham, Chichester (W. Jeffery).

Var. *fragilis*, Linné.—Lewes, in the Pells (W. C. Unwin).

Var. *variegata*, Hazay. — Winchelsea (Rufford collection, Hastings Museum).

L. glabra, Müller.—Ditches and shallow pools, rare. Wayside pools beyond the Great Pool. Horsted Keynes (W. Whitwell); Water-hole by roadside at Framfield, near Uckfield (Rev. C. E. Y. Kendall); near Malling, Lewes (W. C. Unwin); Heathfield (E. A. Butler); in narrow grassy ditches at Albourne, Cowfold, and Henfield (W. Borrer).

Planorbis corneus, Linné. — Ponds and sluggish streams, widely distributed.

Var. *albina*, Moquin-Tandon.—Lewes (C. H. Morris); near Arundel (W. Jeffery).

P. albus, Müller.—Generally distributed in ponds, lakes, and ditches.

P. glaber, Jeffreys.—A very rare species. Only two Sussex records. Shoreham (W. Jeffery, 'Journal of Conchology,' v. 41); "I have found this species in a small pond in my own grounds at Cowfold" (W. Borrer, quoted by Harting, 'Zoologist,' 1878, p. 165).

P. crista, Linné (= *P. nautileus*, Linné).—A common species. The smooth form known as var. *lævigata*, Adami, is equally abundant as the type.

P. carinatus, Müller.—Locally abundant in ponds and slow-running streams. Lewes Levels (W. C. Unwin); marsh ditches, Southover, Lewes (Jenner); Malling Marshes (Unwin); Hastings (Diplock's 'Guide'); common in the levels of the Arun and Adur (J. E. Harting); Harting (Weaver); Surrey and Sussex Canal, near Alfold (E. W. S.).

P. umbilicatus, Müller (= *P. complanatus*, Jeffreys).—Abundant in ponds and slow-running streams.

Var. *rhombea*, Turton.—Marshes between Lewes and Newhaven (W. C. Unwin); Lewes (Rev. C. E. Y. Kendall).

Monst. *terebrum*.—Ratham, Chichester (W. Jeffery); Pevensey (Rufford collection, Hastings Museum).

P. vortex, Linné.—Widely distributed in ponds and slow-running streams. Frequently malformed.

Var. *compressa*, Michaud.—Pevensey (A. J. Alletsee). There are specimens in the Rufford collection, Hastings Museum, also a scalarid example.

P. vorticulus, Troschel. (Plate IV.)—It bears much resemblance to immature *P. vortex*, but the body whorl is only very slightly keeled. Until recently in this country it was known only from Pleistocene deposits at West Wittering (Messrs. B. B. Woodward and A. Santer Kennard). In 1911 it was found sparingly in the living state in Malling Marsh, near Lewes, and Pevensey Levels by Mr. Edward Collier.

P. spirorbis, Linné.—Common. Mr. Clement Reid notes that this species and *P. vortex* occur in the mist ponds on the Downs.

Var. *albida*, Nelson.—Lewes (C. H. Morris).

P. contortus, Linné.—Widely distributed in ponds and ditches.

Var. *albida*, Jeffreys. —Lewes (C. H. Morris); Pevensey Marshes (Rev. W. A. Shaw).

P. fontanus, Lightfoot (= *P. nitidus*, Müller, of Jeffreys).—Generally distributed in ponds and sluggish waters.

Segmentina nitida, Müller (= *Planorbis lineata*, Walker).—A local species. Abundantly distinctive in the Nautilus-like septa. About Lewes (Borrer, and many others); Winchelsea (A. J. Alletsee); Pevensey Marshes (A. G. Stubbs, and many others); pond between Hurst Green and Lamberhurst (T. D. A. Cockerell); in a pond at Old Deane Farm, Henfield (W. Borrer); Harting (Weaver).

Physa fontinalis, Linné.—Generally distributed.

Aplecta hypnorum, Linné.—A local species. Pevensey Levels (E. A. Butler and others); Barcombe (Jenner); Bopeep and Guestling (Rev. E. N. Bloomfield); stream at Wellingham and at Leighside (Eastbourne Nat. Hist. Soc.); Winchelsea and Snailham (Craven); Ratham, near Chichester, and Lindfield (W. Jeffery); near Pulborough (E. W. S.); Singleton, Chidham, and Bosham (Rev. W. A. Shaw).

Paludestrina confusa, Frauenfeld.—It occurs in the Pleistocene deposits at West Wittering, where it was first detected by Mr. Clement Reid. Regarding it as synonymous with *Pseudamnicola anatina*, Drap., Mr. Craven records it as common at Winchelsea and Snailham ('Hastings and East Sussex Naturalist,' ii. 101, April, 1914).

P. jenkinsi, Smith.—Frequenting brackish waters. Locally abundant. Lewes (C. H. Morris, 1894, and more recently by other observers); ditch at Litlington, near Eastbourne (A. G. Stubbs); Pevensey Marshes (Rev. W. A. Shaw); in ditches connected with the River Adur at Beeding (L. E. Adams, J. C., xiii., 68).

P. ventrosa, Montagu.—In brackish waters. Pevensey (A. J. Alletsee); near Winchelsea, in ponds on beach (E. A. Butler).

Var. *pellucida*, Jeffreys. — Thorney Island, plentiful (Rev. W. A. Shaw).

P. stagnalis, Basier (=*Hydrobia ulvæ*, Pennant).—Frequenting brackish water. Camber Sands, Rye (E. A. Butler); River Adur, Shoreham (Rev. C. E. Y. Kendall); Bognor (H. L. F. Guermonprez); Bosham and Pagham (Rev. W. A. Shaw). It is probable that the species of *Paludestrina* recorded above are widely distributed on the Sussex coast, though the records are very few.

P. marginata, Michaud.—It is recorded from Pleistocene deposits at West Wittering by Mr. J. P. Johnston. Extinct in Britain, but surviving in France.

Bithynia tentaculata, Linné.—Generally distributed.

Var. *ventricosa*, Menke.—Common in the Levels, Lewes (W. C. Unwin); marsh ditch near Camber Castle (Eastbourne Nat. Hist. Soc.).

Var. *albida*, Rimmer.—Pevensey (Rufford collection, Hastings Museum).

Monst. *decollata*.—Canal near Alfold (E. W. S.).

B. leachi, Sheppard.—Widely distributed.

Var. *albida*, Rimmer.—Pevensey Marshes (Rev. W. A. Shaw). A form with raised longitudinal brown stripes was found near Pevensey by Mr. P. Rufford.

Vivipara vivipara, Linné (= *Paludina vivipara*, L.).—Canals and sluggish streams; rare. Pevensey Level and the marsh drains between Siddlesham and Selsea (J. E. Harting, as doubtful). "The only recorded locality for this shell is the River Arun (W. Borrer, in 'Zoologist,' 1878). I found it numerous at Wisbro' Green in 1877 in a ditch supplying the Wey and Arun Canal. It probably came from the Wey" (W. Jeffery). Bognor (H. L. F. Guermonprez).

Valvata piscinalis, Müller.—Ditches, canals, and sluggish streams; generally distributed. Mr. W. Jeffery once took "about three hundred and fifty shells from the stomach of a large Eel, nearly all of which belonged to this species."

Var. *albina*, Jeffreys.—Lewes (C. H. Morris), Litlington, near Eastbourne (A. G. Stubbs).

V. macrostoma, Steenb. (Plate IV.)*—This species closely resembles the var. *depressa* of *V. piscinalis* (a variety which differs from type in the very depressed spire and broad umbilicus), but Mr. Edward Collier and others note that it is quite different in texture and colour of shell. It has been taken by Mr. Collier in Malling Marsh (Journ. Conch. xiii. 285, 316), and at Chidham and Pevensey Levels by the Rev. W. A. Shaw.

V. cristata, Müller.—Generally distributed.

Assemania grayana, Leach.—This species is included by Mr. Frederick Dixon in his 'Geology and Fossils of the Tertiary and Cretaceous Formations in Sussex' (1850), in a list of the "more obvious examples" of shells found in the post-Pliocene deposits at Bracklesham Bay, and named for him by Mr. G. B. Sowerby (p. 17).

Pomatias elegans, Müller (= *Cyclostoma elegans*, Müller).—Widely diffused, abundant on the chalk, absent from the Vectian sands about Blackdown. The Rev. W. A. Shaw has found it in a post-Pliocene deposit at Kingley Vale, West Stoke.

Var. *ochroleuca*, Moquin-Tandon.—Always with the type about Shoreham, Lewes, and Steyning (Rev. C. E. Y. Kendall); Heyshott Down (E. W. S.).

Acicula lineata, Draparnaud.—Apparently very rare. Mr. Ralph Tate found it in Fairlight Glen and Coghurst Wood. There are no records from the western division of the county.

Neritina fluviatilis, Linné.—Very local. "Locally common in the Ouse, Cuckmere and East Rother districts. Plentiful in the Cockshute Stream at Lewes" (J. H. A. Jenner); "plentifully in the Arun, a few miles above the town of Arundel" (W. Jeffery);

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* Plate IV.—*Valvata macrostoma*, Steenb. Shells, nat. size (inset) and magnified 6·66, the central one shows the operculum *in situ*. *Planorbis vorticulus*, Troschel. Shells, nat. size (inset) and magnified 6·66. From specimens loaned by Mr. Edward Collier.

"from mud thrown out of a ditch in the level of the Arun between Burpham and Arundel" (W. Borrer).

Unio pictorum, Linné.—Widely distributed.

U. tumidus, Retzius.—Very local. Ouse, Cuckmere, and East Rother districts (Jenner); Hastings district (Hastings Phil. Soc.); in the muddy bottom of the Brede River, abundant (R. Tate).

Anodonta cygnæa, Linné.—Widely distributed.

Var. *anatina*, Linné. — Sometimes classed as a species. "Burton and Wisboro' Green, have taken the var. *complanata* at Burton (W. Jeffery); Cowdray Park (D. Taylor); Landport, near Lewes (Jenner); Plumpton and Norlington (C. H. Morris); Pevensey Sluice (Eastbourne Nat. Hist. Soc.); Crowhurst and Robertsbridge (Hastings Phil. Soc.).

Var. *incrassata*, Sheppard.—Powder Mill, Battle (Jenner). Specimens in the Hastings Museum were obtained from this locality by Mr. E. J. Bailey.

Corbicula fluminalis, Müller.—It has been recorded by Mr. J. P. Johnson from the Pleistocene at West Wittering. A widely distributed fossil on the Continent; in Britain not known outside of the Thames-Rhine system.

Sphærium rivicola, Leach.—Sluggish rivers and streams. Rare in Sussex. Near Hastings, rare (Rev. E. N. Bloomfield); Arun at Burpham, near Arundel (W. Borrer).

S. corneum, Linné.—Generally distributed in ponds and ditches.

Var. *nucleus*, Studer.—Lewes Marshes (J. H. A. Jenner).

Var. *flavescens*, Macgillivray.—Millstream at Burton, near Petworth (W. Jeffery); Cockshute, Lewes (C. H. Morris).

S. lacustre, Müller.—Widely distributed.

Var. *brochoniana*, Bourguignat.—Rotham, near Chichester (W. Jeffery).

Var. *ovalis* Férussac.—Landport Marshes, near Lewes (J. H. A. Jenner).

Pisidium amnicum, Müller.—Common in lakes, ponds, rivers, and canals.

P. henslowianum, Sheppard.—Ponds, ditches, and sluggish streams; apparently rare. Lewes Levels (W. C. Unwin); Northchapel (D. Taylor); Surrey and Sussex Canal, near Alfold (E. W. S.).

P. subtruncatum, Malm. (= *P. fontinale*, Jeffreys).—Widely distributed.

P. pulchellum, Jenyns.—Apparently rare, only three records. Ditches, Pett Level (R. Tate); Hastings district (Hastings Phil. Soc., second suppl.); Brighton district (Mrs. Merrifield).

P. pusillum, Gmelin.—Widely distributed.

P. cinereum.—Apparently very rare. A single record. Dried-up ditch at Chidham, 1911 (Rev. W. A. Shaw).

P. nitidum, Jenyns.—A local species. Near Hastings and Guestling (Hastings Phil. Soc.); ditches at Lewes, Henfield, and Eastbourne (W. C. Unwin); deep ditches and pits at Chidham (W. Jeffery); Surrey and Sussex Canal, near Alfold (E. W. S.).

P. obtusale, Pfeiffer.—Locally abundant. Brighton district (Mrs. Merrifield); Lewes (W. C. Unwin); streams at back of Southover Crescent, Lewes (Lewes Nat. Hist. Soc.); Warbleton (F. H. Sykes); Pannell's Hole, Harting (W. Weaver); Burton, near Petworth (W. Jeffery).

P. gassiesianum, Dupuy (= *P. roseum*, Jeffreys).—A local species. Hastings (Rev. E. N. Bloomfield); Pevensey Marshes (Rev. W. A. Shaw and L. E. Adams); Chidham (Rev. W. A. Shaw).

In concluding this catalogue of the land and freshwater Mollusca of Sussex, I wish to express my thanks to the following conchologists for much kind help in its preparation:—The Revs. C. E. Y. Kendall and W. A. Shaw, Messrs. E. A. Butler, W. Ruskin Butterfield, E. Collier, H. L. F. Guermonprez, J. H. A. Jenner, D. Taylor, H. Toms, and W. Whitwell; and to Messrs. H. D. Gower and W. H. Thornton for photographs.

I must also acknowledge my indebtedness to Mr. J. W. Taylor's elaborate and indispensable Monograph for many records, chiefly concerning the *Testacellidæ*, *Limacidæ*, *Zonitidæ*, and *Arionidæ*.

NOTES AND QUERIES.

MAMMALIA.

Weasel Feeding upon Frogs.—Noticing a Weasel that was evidently interesting itself in a three months' old pullet that was wandering about my orchard, my son and I decided to watch for further developments. The Weasel stalked the chicken by working from behind a large pear tree, up to within some ten feet of it. Here it seemed to decide that its quarry was too large for its further attentions, and it returned nearer to where we stood. Here for fully a minute it gambolled about in a most remarkable way, and in one action apparently turned a complete somersault in the air. It then came to within a few feet of us, and proceeded to work a patch of coarse grass, and eventually pounced upon a victim, which action was accompanied by a squeal, but whether uttered by the Weasel in its excitement, or its prey, we could not satisfy ourselves. It quickly emerged carrying a full-grown Frog in its mouth, and made its way to a hole in the root of one of the orchard trees, but we succeeded in making it drop the Frog before it gained the entrance. The Frog had been seized across the back, just behind the head, and was apparently dazed with fright, as it took some time to recover its activity. We eventually killed the Frog and placed it near where the Weasel had left it, whence it was soon after removed.—J. Steele Elliott (Dowles Manor, Salop).

Albino Water-Vole in North Notts.—On September 7th through the kindness of a friend I had the pleasure of adding a albino Water-Vole (*Microtus amphibius*) to my collection, which was obtained locally; he was walking by the side of a stream when the Vole came out of its burrow and swam across the stream; its burrow was easily found, and was just level with the water. He stopped the entrance with a stone, and waited results; the Vole shortly returned, and in the attempt to regain its burrow, it became entangled in the water-weeds that were on the surface of the water close to its burrow, and was then easily captured. An albino specimen was killed by a shot from a catapult on the same stream, not far from the place where the one under notice was obtained, but the person who obtained it cut off all the feet and made a flat skin of it, and converted it into a little mat for his dressing-room table.—William Daws (Mansfield, Notts).

The Grey Squirrel in Bucks and elsewhere.—The note by Mr. Aplin in your current issue (p. 354) adds another English locality to the records of this species. The occurrence of a single individual is not of much consequence, but Whaddon Chase, the locality named, is likely to share in any spread of the species, as Bucks and Beds are two of the counties in which the Grey Squirrel has run wild for some years. See some particulars in the accompanying reprint.* To the localities named therein I am now able to add Norfolk and also near Manchester, but cannot say what success has followed the introductions there.—Hugh Boyd Watt.

Cats with Abnormal Tastes.—From time to time one meets with or hears of Cats with strange and abnormal tastes in the matter of diet. Many instances of vegetarian Cats, like the Persian mentioned by Miss Holloway ('Zoologist,' August, 1915, p. 316) have found their way into natural history journals and magazines, while other equally remarkable cases of this, and other vagaries of feline appetite, have probably never been recorded. Some Cats have a distaste for milk, and others care but little for meat or even refuse it altogether. A writer in the 'Field' of October 25th, 1890, gives an account of a Cat which preferred raw potatoes to meat, and was once discovered dragging a large cucumber from the dining-table in preference to a lamb cutlet, equally within his reach. This Cat had been seen also to eat mushrooms, stalk and all. In the same paper, under date of August 6th, 1881, mention is made of a Persian tom which used daily to eat two raw potatoes which were cut up for his special benefit. Besides asparagus, raw potatoes, and cucumbers, Cats have been known to devour raw carrots and turnips, cabbages, broccoli, seakale, tomatoes, vegetable marrows, melons, and even coconuts and preserved olives.† A vegetarian Cat belonging to Mr. A. H. Keane, is stated by him, in the 'Field' of August 23rd, 1881, not only to have been fond of raw potatoes, tomatoes, and vegetable marrows, but also to have been in the habit of searching the dustbin for the marrow seeds, of which he was very fond. A Manx Cat we once had used to steal baked pears whenever he could get at them, carrying them off to enjoy quietly by himself. We once had here a most useful rat-catching Cat of the ordinary short-haired breed, a member of a family of tortoiseshells, noted for their skill and prowess in that particular line. I one day found her crouching on the ground, devouring what seemed from her manner to be some unusually choice morsel, and growling over it as a Cat does with a mouse or bird. On going to see what she had caught, I found her eating a very large earthworm. The daughter of this Cat—a fine large tortoiseshell and white, had also peculiar tastes. Though of a quiet home-loving disposition, and not prone at other times to stray far from the house and garden, she had a habit of going off at times to a swampy piece of ground in order to catch and eat frogs. In the spring she would stand at the edge of a pond and eat the frogs' spawn which she dragged out of the water. I have also seen the same Cat feeding on a fungus growing in a plantation near the house which I believe to be *Agaricus procerus*, the parasol agaric. This species seems to be relished by other animals besides Cats, as it sometimes shows marks of the teeth of small rodents of some kind. This summer (1915) a small and very inconspicuous fungus, which I have as yet been unable to identify, appeared here in a kitchen garden about the strawberry and raspberry beds in particular, and had extraordinary attractions for some of our Cats. It had a rounded cap, and was of a dark smoky brown or dingy grey colour, not unlike that of the soil upon which it grew. For several weeks, in fact as long as any of the fungi could be found, two of our Cats used to go almost daily to search for them, carefully examining the places where they were wont to make their appearance, and showing much excitement at each "find." Curiously enough the other Cats would neither eat nor take much notice of them.—G. T. Rope.

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* In this, an interesting summary of the history of the Grey Squirrel in Britain, published in the 'Field' for June 12th of the present year, Mr. Boyd Watt gives as localities for colonies, besides several London ones and those in Bucks and Beds, Scampston Hall, Rillington, in Yorks, and a territory twenty miles by five in Dumbarton. In Ken Wood, Hampstead, the Grey and Red Squirrels, it seems, live together "in some numbers."—Ed.

† See the 'Field,' August 6th, 1881.

AVES.

Albino Pheasant.—For years I have been on the look-out for a true albino Pheasant, but met with no success until last Christmas time, when I fortunately secured a specimen from a local game dealer; it was killed on the Welbeck Abbey Estate. It is a fine male with pink eyes. I might say that a good number of white Pheasants have passed through my hands, but this is the only true albino that I have seen so far, with the pink eyes; the colours of the eyes of the other white Pheasants that I have examined have ranged from lemon-colour to light brown. I shall be on the look-out this coming Pheasant-shooting season for a female albino, to go with the male already in my collection.—William Daws (Mansfield, Notts).

Dunlin in North Notts in Summer Plumage.—On May 13th, 1915, a friend brought me a Dunlin (*Tringa alpina*) that had that morning flown into a workshop just outside Mansfield; it made a dash for the skylight in its attempt to regain its liberty, but it struck its head with such force that it fractured its skull and died directly. It is a male in summer dress; it is very unusual to obtain them in their breeding-dress in this district. I am not aware of the Dunlin breeding in North Notts, but we frequently see them in small parties in the autumn, particularly when the water in the local reservoirs is low and exposes a fair quantity of mud for them to explore for food.—William Daws.

Little Owls in North Notts.—The Little Owl (*Carine noctua*) appears to be increasing rather rapidly in this district (Mansfield) the last year or two; I have heard of a fair number being shot. Some were said to be young Owls, but by the description given, in several cases, there is no doubt that several of them were Little Owls. I have had three sent me recently, the last on August 28th. One man complained about their destruction of his game chicks by daylight; he said one of them was a regular pest, as it was taking these chicks day after day. The first time he saw it, he thought it was a male Sparrow-Hawk, but he waited in ambush for it, and when it fell to his gun it proved to be a Little Owl.—William Daws.

Stock-Dove Breeding in a Church-Tower.—On August 21st, as I was passing through our churchyard, a Stock-Dove flew out of the hole in the tower which earlier in the year had been occupied by Tawny Owls, and when I went up I found a nest with two eggs. One of these was a failure, but the other hatched, and to-day (September 30th) the young bird was thriving and nearly fit to fly. He is an amusing little chap, snapping his beak at an intruder like an owlet, and striking with his wing at a hand put near him; in fact, I do not touch him now for fear of his breaking his wing against the stone. I have only seen one nest in the tower before, and that was in the same hole many years ago. There are still (or were a few days ago) two young Stock-Doves in one of our boxes, and two eggs, which looked almost fresh, in another. This bird is our earliest and also our latest breeder; I have seen eggs in February.—Julian G. Tuck (Tostock Rectory, Bury St. Edmunds, Suffolk).

Mandarin Duck Feeding in a Tree.—On Sunday, September 12th, I saw a Mandarin Drake (*Aex galericulata*) which was hatched last year at the Zoo and has fortunately escaped pinioning, fly from a low fence into a small oak-tree in which some Wood-Pigeons were feeding on the green acorns; I then saw him pulling at the leafy twigs from the branch on which he stood, and though I cannot say for certain he was eating the acorns, I presume that this was what he was doing, as I afterwards saw him fly to another bough, no doubt to get a more favourable position for picking them, and on the following Sunday I again saw him behave in exactly the same way.—F. Finn.

Hobby in Petersfield District.—I am sorry to record the death of a fine old male Hobby which was shot here during July last whilst it was ranging a field where there happened to be some Pheasant coops. This is the only Hobby I have ever seen in this locality.—(Rev.) H. Marmaduke Langdale (Compton, Petersfield).

PISCES.

Colour-change in Fish.—That not only Tench, but probably all species of freshwater fish without exception (certainly most British species), involuntarily change colour so as to harmonize with the bottom of the stretch of water they frequent, must have been known ever since people first began to keep fish in confinement, not only in glass aquaria, but in any artificially circumscribed basin. I have not forgotten my astonishment fifty or more years ago, when, having temporarily placed a mixed lot of fish (Roach, Dace, Gudgeon, and probably two or three other species, but I cannot recollect with certainty) in a white bath, where they were of course very conspicuous, I found, after a short time (perhaps less than an hour, but certainly under two), that they had all become quite pale and inconspicuous. Since then I have seen the same change and its reverse over and over again, so that I should no more have thought of noting it than the apparent fact that the sun rises and sets every day. Whether sea-fish have the same power of unwittingly changing colour I do not know, but as the large majority inhabit such much deeper water, they may have no need for this provision; but as Mr. Milligan has sea-water aquaria, he has a chance of making observations which, even if they should prove not to be new, would be so at any rate to me.—Alfred H. Cocks (Poynetts, Skirmett, near Henley-on-Thames).

INSECTA.

Hornet's Nest in the Ground.—In reference to the Rev. Julian G. Tuck's note in the 'Zoologist' for August, p. 320, I once saw a Hornet's nest in a low hedge-bank by the roadside at Framfield, Sussex. I have no recollection of ever having seen another in the ground. I doubt if a Hornet has been seen by me in this district for over thirty years.—Robert Morris (Uckfield, Sussex).

NOTICES OF NEW BOOKS.

Spencer Fullerton Baird. By William H. Dall, D.Sc. Philadelphia and London: J. B. Lippincott Co. 1915. 15*s*. net.

In this handsome and copiously illustrated work, Dr. Dall gives us a most interesting biography of the late Professor Baird, formerly head of the Smithsonian Institution, a distinguished naturalist of very wide zoological interests, with that practical bent of mind and amiability of character which seem so often to distinguish American zoologists. Perhaps the economic work they have to do may have something to do with this; Professor Baird, in particular, distinguished himself in connection with the attempts of the United States Fish Commission, of which he was the first chief, to increase the supply of food fishes, which have been, in many cases, crowned with success; as in the cases of the re-population of the Pacific Coast Salmon-grounds by hatcheries, and successful transference of the Shad from the Atlantic Coast to the Pacific, where it is now a market staple, while "the inshore Cod-fishery of New England was measurably restored." Yet, as we are told, "so great a zoological authority as Huxley, appointed to a somewhat similar board of inquiry in regard to the North Sea Fisheries of Great Britain, had no hesitation in declaring that no actions of man could have the power either to increase or perceptibly diminish the quantity of fishes in the sea; and that all such changes were due to causes beyond human foresight or control." Although a great museum official, however, and a teaching Professor of great note, Baird was always a good deal of a field naturalist and keeper of live animals, as the copious extracts from his correspondence with Audubon, Dana, Agassiz, and others, which vary these pages, abundantly prove; and field naturalists, like fanciers, learn, or should learn, to be very careful in talking about zoological "impossibilities." A quaint bit of folklore about the Scottish ancestors of the Professor's family deserves quoting: Thomas the Rhymer had prophesied that there "would always be an eagle in the crags of Pennan while there was a Baird in Auchmedden," and the birds supported the bard loyally, disappearing when the Earl of Aberdeen purchased the estate, to return when his eldest son, Lord Haddon, married a Miss Baird, and depart again when the estate changed hands a second time. "In the presence of these curious facts, attested by many witnesses, the people in the neighbourhood, when the estate was acquired in 1854 by Mr. Robert Baird, become curious to see whether the eagles would return. In particular the Rev. Mr. Gardiner, the then minister of the parish, was on the look-out. Strange to say they did return to their old eyrie, and continued there for some time "till driven away for good by being shot at by the Pennan coastguards."

The Amateur Menagerie Club Year Book, 1915. Edited by G. Tyrrwhitt-Drake.

The present little volume is far the best of these year-books we have seen, and should be in the hands of everyone who is interested in animals and has anything to do with their practical management in captivity, as it contains much information of scientific value and an unusual number of practical hints. Dr. Hornaday, of the New York Zoological Park, gives a full account of the young female Gorilla under his charge, and now thriving, after recovery from a serious illness. We note with interest that a large portion of her food is human diet—a restaurant dinner, in fact; such feeding suits anthropoids well, as we have often observed in the case of those kept in the Hamlyn establishment. Sir Claud Alexander's "Notes for Novices" are invaluable, for he enters into the most minute details as to the practical management of both carnivorous and herbivorous mammals, especially as regards the all-important point of feeding. He is quite contented with very modest housing, his own dens being "old showmen's waggons," and prefers boarded floors to stone ones. There seems to be in progress a feeling for simplicity in exhibitions of animals, for we find Dr. Renshaw declaring, what we have often remarked ourselves, that "the chief bane of zoological collections may be summed up in two words—architecture and horticulture." We do not, however, agree with his recommendation of green paint for wirework; we think it dangerous, and tar-varnish is much better. Mr. R. Scott Miller gives an interesting account of his success in breeding Raccoons; his accommodation was most simple—a corrugated iron lean-to 9 ft. deep by 5 ft. wide and 6 ft. 6 in. at the eaves, with branches and a barrel. Miss E. Chawner has valuable notes on the small

South African Chamæleon (*Chamæleo pumilus*), which she has several times bred; the young, it seems, have a curious habit of eating bits of their cast skins, and have little power of colour-change.

There are other interesting notes which space forbids us to mention, and very numerous illustrations, most of them to our thinking rather unnecessary; but the Duchess of Bedford's photograph of a Mule between a Grévy's Zebra stallion and a large Spanish Ass (also shown) is of great interest, indicating this hybrid to be well striped, whereas a hybrid between the Somali Ass (a race of *Equus asinus*) and a mare of the Mountain Zebra bred at the Zoo is nearly devoid of stripes except on the legs and shoulders.

Typical Flies. By E. K. PEARCE. Cambridge University Press. 1915. 5*s*. net.

THIS is a photographic atlas of typical Diptera, including the Aphaniptera or Fleas. The photographs are admirably clear and have useful short notes under them. The preface contains practical hints on collecting and preservation, and Brauer's classification of the order is also given. The work should be of great value to those beginning the study of this important and difficult group of insects.

Mind in Animals. By E. M. SMITH. Cambridge University Press. 1915. 3*s*. net.

THIS manual deals with the various manifestations of animal intelligence and instinct, from the simple reactions of the Protozoa to the complex minds of such high mammals as Monkeys. There are special chapters on Instinct, Homing, Imitation, and other topics, and much valuable information is given. Some of the methods by which experimenters have sought to gauge animal intelligence seem to us not very creditable to their own; we do not see that much is gained by testing the abilities of animals to find their way out of absolutely unnatural difficulties as models of the Hampton Court Maze, the original being admittedly a poser for many human beings, and we quite agree with the author's criticism of the puzzle-box method of research, in which a hungry animal is shut up and forced to find a way out of its prison, such as by lifting a latch, before getting at food. "The hungry animal," it is rightly said, "in close confinement, is in a mood far from that state of calm collectedness favourable to the scientific examination of a novel situation. Nor should it be lost sight of that though the particular action required may not be strange, yet taken in its near connection it is, presumably, entirely foreign to the subject, and about as meaningless as a camera or combination letter-lock would be to an unsophisticated Patagonian."

Through Western Madagascar. By Walter D. Marcuse. London: Hurst & Blackett. 1914. 7*s*. 6*d*. net.

Though largely devoted to the question of the exploitation of commercial products, especially the American Lima or butter bean (*Phaseolus limensis*), which has been acclimatized in Madagascar, and is there cultivated with extraordinary success, this book, most interestingly written, contains many notes of interest on the fauna of an island one does not hear much about as a rule. For instance, we are told of the wild cattle of the Menabé country, estimated as at least 20,000 head, that a friend of the author's, an old resident of the country, "is of the opinion that they show a slight strain of the Zebu, and tells me that in some of the specimens shot by him the faintest trace of a hump is discernable." Now, as our author mentions, and as one of the excellent photographic illustrations shows, the tame cattle of Madagascar are typical humped Zebus; does his friend's observation mean that the wild animals breed with tame, and are themselves of European stock, or does the humped breed when wild lose the hump and assume the characters of ordinary cattle? We may mention that in India, the home of the Zebu breed, humpless specimens are common. The note that in handling a wounded White-faced Tree-Duck (*Dendrocycna viduata*), one has to look out for scratches, reminds one of Colonel Hawker's well-known remark about a wounded Coot; this Duck is extraordinarily like a Coot in contour and in its springing method of diving, so that it is interesting to find it has evolved the same method of defence. Crocodiles, it seems, are still the terrors of Madagascar, being dreaded man-eaters; native legends credit the Cormorants, which our author says feed chiefly on the fresh-water snail (*Melanatria johnsoni*), with watching over and warning these reptiles against man.

BRITISH
10 DEC 15

Obituary.

THOMAS PRICHARD NEWMAN.

It is with very deep regret that we have to inform readers of the 'Zoologist' of the sudden decease of its proprietor, Thomas Prichard Newman, on November 10th. As most naturalists are aware, the 'Zoologist' was founded by the late Edward Newman, the father of the subject of this notice, and when the Journal passed into the hands of Thomas Newman he took the keenest interest in carrying it on according to its old traditions. As a business proposition there was, and is, little in it to appeal to a business man, and Thomas Newman was more of a business man than a naturalist. His sympathies were, however, still more closely connected with certain forms of philanthropy (using this word in its highest sense), and this trait in his character, and his feeling of regard for his father's repute as a naturalist, led him to continue the issue of our magazine when many a business man would have felt inclined to transfer it to others at a profit, as he might have done at one time. There must be many of our readers who have at some time or other met Thomas Newman in business, and at meetings of various kinds. He was for long a Fellow of the Entomological and of the Zoological Societies. All who knew him must feel that a man has gone from us who was a man of worth, of honour and honesty, and of exceptional courage in his opinions.

As a member of the Society of Friends he needed all his courage to bear up and hold to his views during the present war, and the feeling is irresistible that the apparent failure of his constant efforts towards International Arbitration, as against Force of Arms, hastened his death. To the last he was convinced that the failure was only temporary. May it be so, and may his work in this direction be carried to ultimate success by others as enthusiastic in his beliefs as he.